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(56) Documents Cited

US 3903991 A

(58) Field of Search

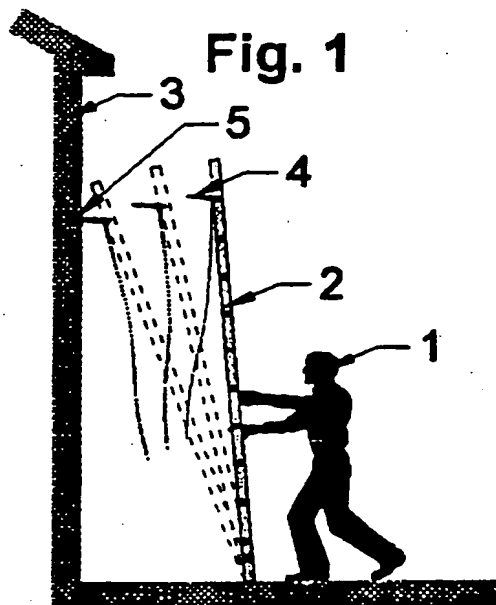
UK CL (Edition P) E1S SLW1

INT CL<sup>6</sup> E06C 7/48

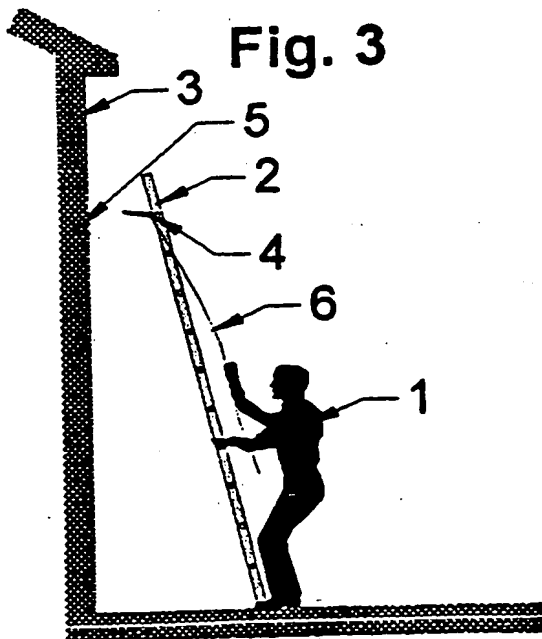
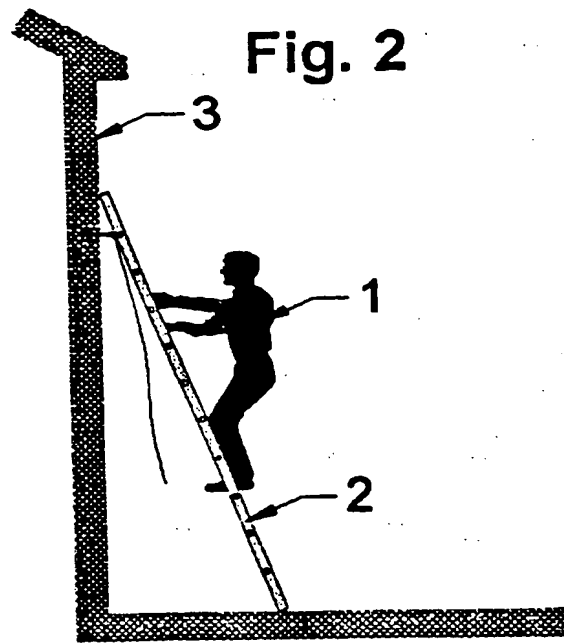
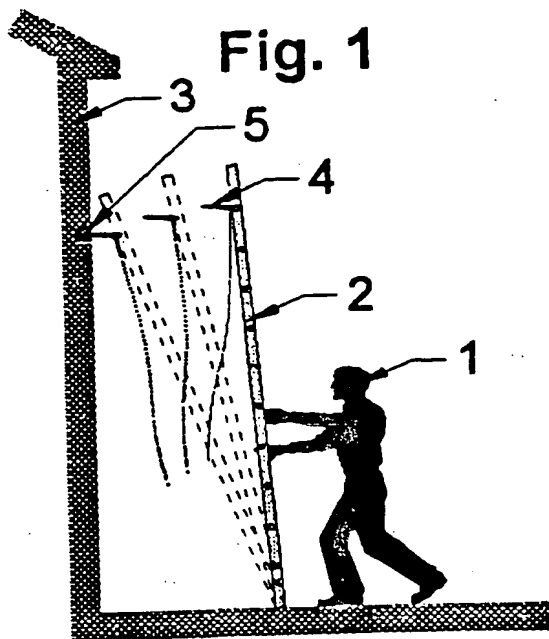
(54) Abstract Title

Locking ladder restraint

(57) In order to improve the safety of a person using a ladder (2) leant against a building, a socket (5) is fitted in a wall (3) of the building and a spigot (4) is mounted on the ladder (2). The spigot (4) is held within the socket (5) by a locking mechanism which is releasable by pulling a cord.



GB 2 326 664 A





**LADDER FITTINGS AND SYSTEMS**

**Field of the Invention**

This invention relates to ladder fittings and systems.

In order to reduce the incidence of accidents resulting from maintenance men, aerial installers and the like working on ladders in high wind or other adverse conditions, some buildings have been provided, adjacent the apex of the roof, with a hook formation to which a ladder can be tied. Such hook formations are unsightly and thus not acceptable to many householders.

In addition, it is necessary for the person using the ladder to climb up the ladder in order to tie it to the hook formation and then, when he has completed whatever work he had to perform, he must untie the ladder from the hook formation before climbing back down the ladder. The initial climbing up the ladder and the final climbing down the ladder are both carried out with the ladder untied and, therefore, unsafe.

It is accordingly an object of the present invention to provide more effective means for preventing a ladder from slipping when leant against a building.

### **Summary of the Invention**

According to a first aspect of the present invention there is provided a method of improving the safety of a person using a ladder leant against a building, which method includes:-

- a) providing a socket attached to or built into a wall of a building,
- b) providing a spigot complementary to said socket and mounted on or forming part of a ladder,
- c) providing means for holding the spigot within the socket, and
- d) providing a remotely operable release mechanism for releasing the holding means to permit separation of the spigot from the socket.

According to a second aspect of the present invention there is provided a fitment for mounting on a ladder to permit the ladder to be used more safely, said fitment comprising:-

- a) a spigot which is complementary to and engageable with a socket attached to or built into a wall of a building,
- b) means for holding the spigot within the socket, and
- c) a remotely operable release mechanism for releasing the holding means to permit separation of the spigot from the socket.

The remotely operable release mechanism preferably includes a cord, rope or the like operable from ground level so that the person using the ladder can climb down to the ground before

releasing the holding means so as to permit separation of the spigot from the socket.

The socket is preferably in the form of a corrosion-resistant fitting built into the wall of the building at an appropriately elevated position and it will be appreciated that some buildings may be provided with a number of such fittings located at suitable positions.

The corrosion-resistant fitting, which may be a plastic moulding, may be shaped to provide a lead-in to facilitate engagement of the spigot in the socket so that, when the user of the ladder is standing at ground level and is moving the spigot into engagement with the socket, the spigot is guided into engagement with the socket.

The corrosion-resistant fitting may be provided with a pivotally mounted flap or cover which normally closes the opening into which the spigot is inserted, the arrangement being such that, as the spigot is moved into its engaging position, it temporarily displaces the flap or cover.

The means for holding the spigot within the socket may comprise a pivotally mounted spring-loaded tooth formation which cooperates with a ratchet or other toothed formation within the socket, the arrangement being such that, as the spigot is being moved into the socket, the tooth formation is displaced against the action of its spring-loading but, when the spigot is fully inserted, the tooth formation moves into its locking position under the action of

its spring-loading. There may, of course, be more than one tooth formation and more than one ratchet or other toothed formation within the socket.

When, therefore, the spigot is inserted in the socket, it will be held positively in position, thus preventing the top of the ladder from moving away from the wall.

The pivotally mounted spring-loaded tooth formation will be arranged for movement out of its locking position, against the action of the spring-loading by pulling on the cord, rope or the like once the necessary work has been completed and the user of the ladder wishes to remove it.

### **Brief Description of the Drawings**

Figure 1 shows a ladder being moved into its operative position in engagement with a wall,

Figure 2 shows the ladder in use,

Figure 3 shows the ladder being disengaged from its operative position, and

Figure 4 is a detail view showing a socket mounted in a wall and a spigot which, in use, is releasably engaged in the socket.

### **Description of the Preferred Embodiment**

Figures 1 to 3 show the method of use of the safety fitment. A socket 5, formed as a plastic moulding, is mounted in an opening formed in a wall 3 or other surface and is fixed permanently in position in the opening which is at an appropriate height to receive a prong or spigot 4 mounted on a ladder 2 adjacent the upper end of the ladder 2.

A person 1 wishing to climb the ladder 2 to enable him, for example, to carry out work at the required height, will bring the ladder 2 up to the wall 3 and will then tilt the ladder 2, as indicated in Figure 1, so that the spigot 4 enters the socket 5 and holds the top of the ladder 2 against sliding downwardly relative to the wall 3. The person 1 can then safely climb the ladder 2 to carry out his work, as indicated in Figure 2.

When the person 1 has completed whatever he needed to do and wishes to move the ladder 2, he will climb down to the bottom of the ladder 2 and will then pull on a release cord 6 and tilt the ladder 2 into the position shown in Figure 3 to disengage the spigot 4 from the socket 5. It is to be noted that engagement of the spigot 4 with the socket 5 is effected from ground level, and that disengagement of the spigot 4 from the socket is also effected from ground level.

In the specific arrangement shown in Figure 4, the spigot or prong 4 is shown attached to a ladder mounting bracket 9 and includes a main body portion formed with a bore through which the



release cord 6 is passed. The end of the main body portion of the spigot 4 remote from the bracket 9 terminates in a nose cone 10 to which a pair of prong teeth 11 are pivoted. The teeth 11 are spring-urged away from one another by means of a spring 12 and are connected to release levers 13 having a common pivot point to which the release cord 6 is attached.

The presented face 8 of the plastic moulded socket 5 is inclined, as shown in Figure 4, so that the nose cone 10 of the spigot 4 will be directed towards a blind bore contained a plurality of teeth 7 and thus having a function similar to that of a ratchet. Thus, when the nose cone 10 enters the blind bore, the teeth 11 will move towards one another against the action of the spring 12 and then, when the spigot 4 is fully inserted, the teeth 11 will move away from each other into engagement with the teeth 7. When it is desired to move the ladder, the user will pull on the cord 6 so as to move the pivot connection between the two release levers 13 to the right as viewed in Figure 4 and thereby move the teeth 11 towards one another out of engagement with the teeth 7, so that the spigot 4 can be removed from the socket 5.

It is to be appreciated that the particular form of releasable locating mechanism shown in Figure 4 is just one example of the type of mechanism which may be used for this purpose.

**Claims:-**

1. A method of improving the safety of a person using a ladder leant against a building, which method includes:-

- a) providing a socket attached to or built into a wall of a building,
- b) providing a spigot complementary to said socket and mounted on or forming part of a ladder,
- c) providing means for holding the spigot within the socket, and
- d) providing a remotely operable release mechanism for releasing the holding means to permit separation of the spigot from the socket.

2. A method as claimed in Claim 1, substantially as hereinbefore described with reference to the accompanying drawings.

3. A fitment for mounting on a ladder to permit the ladder to be used more safely, said fitment comprising:-

- a) a spigot which is complementary to and engageable with a socket attached to or built into a wall of a building,
- b) means for holding the spigot within the socket, and
- c) a remotely operated release mechanism for releasing the holding means to permit separation of the spigot from the socket.

4. A fitment as claimed in Claim 3, in which the remotely operable release mechanism includes a cord, rope or the like operable from ground level.

5. A fitment as claimed in Claim 4, in which the means for holding the spigot within the socket comprises a pivotally mounted spring-loaded tooth formation arranged for movement out of its locking position, against the action of the spring-loading, by pulling on the cord, rope or the like.

6. A fitment for mounting on a ladder as claimed in Claim 3, substantially as hereinbefore described with reference to and as shown in the accompanying drawings.



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Application No: GB 9813583.3  
Claims searched: 1 - 6

Examiner: P. Gardiner  
Date of search: 22 October 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): E1S: SLW1

Int Cl (Ed.6): E06C

Other:

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	US 3903991 RICHARD D. PHELAN (e.g. Fig's. 1 & 3)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.